Claims

1. A method of closed-loop multi-stream wireless communication between transmitter means (1) comprising a transmit antenna array of N transmit antenna elements and receiver means (3) comprising a receive antenna array (4) of M receive antenna elements, wherein a plurality of distinct data streams (x_1, x_2) are transmitted from said transmit antenna array to said receive antenna array and said data streams are weighted by respective complex weighting matrices before being applied to said transmit antenna array, said distinct data streams being separated and estimated at said receiver means,

   characterised in that said distinct data streams (x_1, x_G) are applied to respective sub-groups (6, 7) of said transmit antenna elements at least one of which comprises a plurality of said transmit antenna elements, each of said sub-groups comprising at least N_d transmit antenna elements, where M is greater than or equal to (N/N_d), said complex weighting matrices (v_1 to v_n) being functions of the respective transmission channels (h_{ij}) of said data streams (x_1, to x_G) including the respective sub-groups of transmit antenna elements.

2. A method as claimed in claim 1, wherein N_d is greater than or equal to two.

3. A method as claimed in claim 1 or 2, wherein each of said complex weighting matrices is calculated to be substantially equal to the eigenvector corresponding to the largest eigenvalue of the matrix $\mathbf{H}^H\mathbf{H}$, where $\mathbf{H}$ is the matrix of the equivalent channel including the respective sub-groups of transmit antenna elements (6, 7) seen by the corresponding data stream and $\mathbf{H}^H$ is the Hermitian transform of the matrix $\mathbf{H}$.

4. A method as claimed in any preceding claim, wherein the number of said transmit antenna elements in each of said sub-groups is re-configurable during operation.

5. Transmitter apparatus for performing a method as claimed in any preceding claim.

6. Receiver apparatus for performing a method as claimed in any of claims 1 to 4.